

IT24101605
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PS Lab Sheet 07

Exercise

1. A train arrives at a station uniformly between 8:00 a.m. and 8:40 a.m. Let the random variable X represent the number of minutes the train arrives after 8:00 a.m. What is the probability that the train arrives between 8:10 a.m. and 8:25 a.m.?

```
setwd("C:\\Users\\03cri\\Desktop\\IT24101605")
|
# Question 01
punif(25, min=0, max=40, lower.tail=TRUE) - punif(10, min=0, max=40, lower.tail=TRUE)
```

```
> setwd("C:\\Users\\03cri\\Desktop\\IT24101605")
>
> # Question 01
> punif(25, min=0, max=40, lower.tail=TRUE) - punif(10, min=0, max=40, lower.tail=TRUE)
[1] 0.375
> |
```

2. The time (in hours) to complete a software update is exponentially distributed with rate $\lambda=1/3$. Find the probability that an update will take at most 2 hours.

```
# Question 02
pexp(2, rate=1/3, lower.tail=TRUE)
```

```
>
> # Question 02
> pexp(2, rate=1/3, lower.tail=TRUE)
[1] 0.4865829
>
```

3. Suppose IQ scores are normally distributed with a mean of 100 and a standard deviation of 15.
- What is the probability that a randomly selected person has an IQ above 130?
 - What IQ score represents the 95th percentile?

```
# Question 03
```

```
# i
```

```
pnorm(130, mean=100, sd=15, lower.tail=FALSE)
```

```
# ii
```

```
qnorm(0.95, mean=100, sd=15, lower.tail=TRUE)
```

```
> # Question 03
```

```
> # i
```

```
> pnorm(130, mean=100, sd=15, lower.tail=FALSE)
```

```
[1] 0.02275013
```

```
>
```

```
>
```

```
> # ii
```

```
> qnorm(0.95, mean=100, sd=15, lower.tail=TRUE)
```

```
[1] 124.6728
```

```
> |
```